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A CERTIFICATE

Advanced Digital Broadcast Polska Sp.z o.o.,

Zielona Góra, Poland

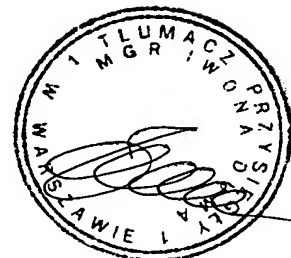
Advanced Digital Broadcast Ltd.,

Taipei, Taiwan

on January 20th 2003 submitted to the Patent Office of the Republic of Poland an application for granting a patent for an invention called „ **A method of automatic control of digital TV decoder operation based on the list of selected programs.** ”

The description of the invention, the patent claims and the drawings, which were attached to this certificate, are true copies of the documents, which were submitted together with the application on January 20th 2003.

The application was submitted under the following number: P-358355.



Warsaw, March 7, 2003

on behalf of the President
Jowita Mazur, MA
Specialist

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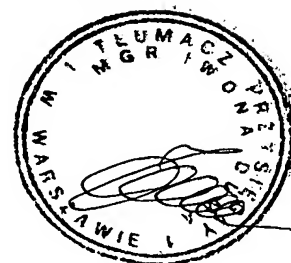
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A method of automatic control of digital TV decoder operation based on the list of selected programs.

The object of the invention is a method of automatic control of digital TV decoder operation, realized on the basis of a list of selected programs.

There are known and commonly applied systems of control of television decoder operation, called parental control systems, which allow controlling any unauthorized use of a TV receiver by children. Such a system is known, for example, from the American patent description no. US 6 072 520. This is a typical system, which has a function of blocking or making specific channels available, blocking or making specific types of programs available. A similar system is known from a European patent application with the number EP 1 134 972. In comparison to typical systems of parental control it has additionally the function of setting a time limit (for example daily limit) to watch television. However the described systems are mainly used to block the receiver in specific moments.



The system, presented in the below given description is used to make specific programs available, which results in a different method of its functioning.

The essence of the method of automatic control of a digital TV decoder operation is that when a program (from the control list, created earlier by the user by selecting the decoder programs) starts, the decoder

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changes from the sleep mode to the active mode. In the active mode the user can watch only the programs located on the list, and after the program from the list ends, in case there are no other available programs recorded on the list, the decoder changes to the sleep mode. Meanwhile, each time a new program from the list starts, the decoder generates an information signal. In the described solution there are available many lists controlling the operation of the decoder. The lists are created by the user or set by the operator, and the user chooses which of the lists should control the operation of the decoder. The lists are associated with a specific topic. The lists, set by the operator can be subject lists or can be associated with names of well-known people, creating thus the so called preferential lists. Moreover, each time a new program from the list starts, the decoder plays sound information in the form of a specific sound of verbal announcement.

In the same time it is obvious that for implementing the presented method of controlling the operation of a digital TV decoder, it must be equipped with an electronic program guide. Using this guide the user selects programs, which create a list controlling the operation of the decoder.

The presented method of controlling television programs being watched allows establishing which programs and in what hours can be watched. Outside these hours the television receiver is inactive. With the beginning of the program, which can be watched, the receiver is automatically activated, and next automatically shut down (changes to sleep mode) after the end of the program. When the receiver is active, the user can watch only the programs, which are on the list. The lists of programs can be created by the user or delivered by the operator. The user can decide,

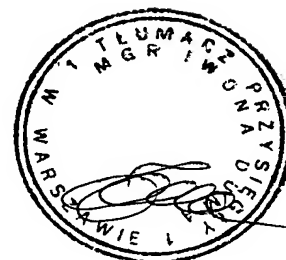


which list will control the work of the receiver. The presented system can have many applications:

- it can be used by parents to control programs watched by children, which means that a parent can decide which programs in what times can be watched,
- it can be used by a person, watching only the specific types of programs: for example the receiver will be activated only in case a specific informational program is broadcasted,
- it can be used in public places, where automatic control of the broadcasted program is needed.

The solution, which constitutes the object of the invention is shown in the example of the implementation in the drawing, in which fig. 1 illustrates a block diagram of a television receiver, fig. 2 – an exemplary appearance of the screen during operation of this function, fig. 3, fig. 4 and fig. 5 illustrate a method of creating or updating the program list, fig. 6 – a format of the list and its exemplary content, fig. 7 – the algorithm of system activation, fig. 8 – the algorithm of system deactivation, fig. 9 – the algorithm of changing the access code, while fig. 10 and fig. 11 are descriptions of the system operation in the ‘list’ mode. Fig. 12 shows examples of the appearance of the screen at a specific hour and with a specific event, which refer to the list presented in fig. 6.

The described system is designed for application in digital television receivers. An exemplary diagram of such a receiver is illustrated in fig. 1 of the drawing. The receiver is equipped with an input block, which is responsible for receiving signal, for example cable, satellite, terrestrial television and for transforming it into a digital data stream, for example an MPEG stream. The digital signal can be unscrambled by



the access control system (Conditional Access). Further the receiver has a memory module consisting of various memory systems, such as RAM, ROM, EEPROM, Flash, HDD, and also a user interface, which allows the user to send commands controlling the decoder. A typical example is a Remote Control Unit. Moreover, the receiver has a system generating image. This system contains audio and video signal decoders, for example AC/3 and MPEG decoder, and also systems generating additional signals, as for example OSD system and systems converting digital signal into a format, which is acceptable by the receiver, for example PAL, SECAM, NTSC. Additionally the receiver has a module for control of operation of other systems and data transfer among them. This function can be served by a specialized processor. The presented blocks are only functional blocks and do not refer to physical electronic elements.

An application can be executed in the presented system. Using this application the decoder operation is supervised and selection of displayed programs is made. The application, by displaying appropriate information by means of the OSD system, allows the user to select appropriate functions. Based on them, the application can control the other functions, as for example turning on the decoder, adjustment of the tuner to the frequency of the requested program, display of this program, interaction with EPG (Electronic Program Guide) application, which makes the television program available.

The further description focuses on presenting the method of co-operation of the system, being described, with the EPG application. The typical EPG application contains data on the content of separate channels, which are presented to the user mainly in the form of a table, where the 'x' axis contains the time, and the 'y' axis contains the name of the TV channel. In the fields the table contains the name of the program broadcasted in a given time on a given channel.

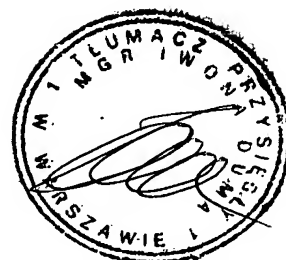


The decoder can operate in the 'normal' mode or in the 'list' mode. If it is in the 'normal' mode, all functions, which enable operations on the lists, are available from appropriate menu. Functions, which modify the settings on the lists, are not available in the 'list' mode.

The described system adds to the EPG system an additional function, which allows creating lists of programs, which can be watched. This can be done by setting specific programs, time interval or program type, which are to be available.

An exemplary view of the screen during the operation of this function is illustrated in fig. 2 of the drawing. The user has selected a mode of setting the program list. By selecting specific fields, after pressing the <OK> button, the given object will be added to the list. In turn fig. 3, fig. 4 and fig. 5 of the drawing are related to creating or updating the program list. The decoder operation can be controlled by one of many lists selected by the user. These lists can be created by the user, set by the operator, or be the operator's lists modified by the user. Therefore a list of available program lists is stored in the decoder. The program lists, which are set by the operator are affixed to it automatically. An exemplary list of available lists can contain the following items:

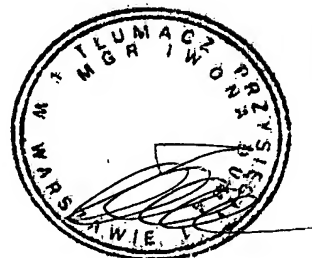
1. Dad_Sport.
2. Dad_News.
3. Mum_Music.
4. Ann_Cartoons.
5. _Mr.X_Recommends.
6. _Mr.Y_Recommends.
7. _Music_the 60's.



Elements 1-4 are the lists, which are set by the users and they can refer to selected sports programs, news, music programs or cartoons for children. Elements 5-7 are the lists broadcasted by the operator. The operator can define its own lists, to make the choice easier for the user. For example, it can be a list consisting of programs, broadcasting music of the 1960's – the operator will create it, based on the subject content of various stations. The operator can also broadcast lists, which are arranged by people well-known from public life, for example by well-known actors, politicians, singers etc. Then, the decoder will be controlled on the basis of the choice made by a specific e.g. actor.

The lists can be stored in the memory of the decoder in a form of files, where the name of the list would in the same time be a filename. Therefore it would be easy to find it. The decoder allocates a certain storage space for the lists, the size of which can be adjusted by the user. The lists can be broadcasted by the operator in the television signal. When new lists appear, the user can choose which lists, out of the ones located in the memory, should be deleted and the lists which should be recorded in their place. Similarly when new lists are being created, if there is no space in the storage, the user can select which list he/she wants to overwrite by a list, which is being newly created.

Fig. 3 shows the algorithm of servicing the functions on the lists, available to the user. After the function of operations on the lists is selected from the menu, the user is presented with a list of available program lists. Next the user has four functions to choose from: to delete, add, create or change the existing program list. If the user wants to delete program lists, he/she selects the ones which are to be deleted. Next, when the choice is confirmed, the lists (files) are removed from the storage. If the user wants to add program lists broadcasted by the operator,



the procedure will display a list of lists broadcasted in the television signal. The user selects the lists, which are to be recorded locally in the decoder. The procedure checks, if there is a sufficient storage space for recording the selected lists. If there is not, it moves to the list deletion menu. If there is a sufficient storage space, it collects the selected lists from the television data stream and records them locally to files. If the user wants to create a new list, the procedure checks if there is space in the storage. If there is space, the user inputs the list name, and next it is created in the storage. If the user wants to modify the list, he/she selects it, and next the procedure of modifying the selected list starts. This procedure is illustrated in fig. 4 of the drawing. The content of the list (the programs, which are located on it) is displayed on the screen. The user has two functions to choose from – to remove elements (programs) from the list and add new elements. If the user chooses the function of deleting the programs, he/she selects the programs to be deleted, and next, after confirmation, they are deleted. If the user selects the function of adding new programs, the procedure from fig. 5 of the drawing is selected. Fig. 5 illustrates the algorithm of adding new programs to the list. The user can create the list by:

- selecting specific programs,
- selecting the time, in which the receiver is to be active,
- selecting the type of programs, which are to be watched.

In case of activating the function of selecting specific programs, the EPG application makes it possible for the user to select programs from EPG table. When the user selects appropriate program and presses the <OK> button, the application will read the information about the program (channel name, program name, broadcasting time), and next will add them to the list. In the next step, the user can choose further programs or finish selection. In case of activating



the time selection function, in which the receiver is to be active, the EPG application will make it possible for the user to choose the time. Next, the user can choose the channels, which can be watched in a predefined time (he can also choose all the channels). In the next step, the specific time interval, with possible restriction of programs, will be added to the list. The user can continue the choice of other time intervals. In case of activating the function of selecting the program type, the EPG application will make the accessible program types available for the user. After the user selects a specific type, he/she moves to choosing the channel, on which he/she would like to watch the given programs type. The user can choose here all the channels. The next step is to define the time, in which the application is to find the specific type of programs. After the user makes the choice, the application reads which programs meet the specific criteria. If it finds such programs, it adds them to the list. Next, the user can choose the next type of programs.

The program lists are stored in the memory of the decoder. They can be stored in Flash memory, on a hard disk or in any type of permanent memory. The format of the list and its exemplary content is illustrated in fig. 6 of the drawing. This list makes it possible for the user to receive the following programs:

- between 12.00 and 12.30 – reception of any program on any channel,
- between 18.20 and 18.40 – reception of program 'Pluto the Dog' on channel 'Cartoon',
- between 19.20 and 19.40 – reception of program 'News' on channel 'News1',
- between 19.30 and 19.50 – reception of program 'News' on channel 'News2',
- between 20.20 and 20.40 – reception of any program on channels 'News1' and 'News2'

The algorithm of creating the list from fig. 3 of the drawing is only one of many functions available for the user of the system.

The list of all functions includes:



- operations on lists – described in algorithms in fig. 3, 4 and 5 of the drawing,
- system activation – described in the algorithm presented in fig. 7 of the drawing,
- system deactivation – described in the algorithm illustrated in fig. 8 of the drawing,
- change of access code – described in the algorithm, illustrated in fig. 9 of the drawing.

Fig. 7 shows the algorithm of the function of system activation. The function checks, if a list was defined. If not – it shifts to the function of list creation, described in fig. 3. If the list is already defined, the function asks for access code. This is to protect the system against any activation by a person, who does not know the code. Such activation would make it impossible to return to normal operation. After the correct code is given, the system shifts to the 'list' operation mode, described in fig. 10 of the drawing.

Fig. 8 shows the function of system deactivation. The function asks for the access code – if the correct code is given, the system shifts to normal work, which enables to watch all the programs.

Fig. 9 shows an exemplary algorithm of changing the access code. The function asks for the old access code. After the user provides the correct access code, the function asks twice for the new access code. When both new codes are identical, the function changes the old code into a new one. If not – it informs the user about the need to enter the code once again and starts the procedure of changing once again.

The algorithms, which were described thus far, had a purpose of presenting the method of the operation of the system. They are based on known solutions. The new features of the described method of controlling the operation of the decoder are illustrated in fig. 10 and fig. 11 of the drawing, which is a description of the system's operation in the 'list' mode.

Fig. 10 and 11 illustrate a model of system operation in the 'list' mode. When the decoder receives a command of changing over to the operation mode list 901, it checks first, if

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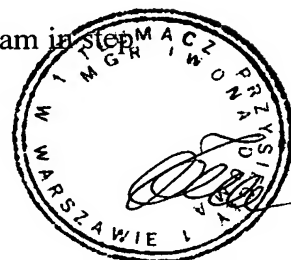
there is any active program for the current time 902. If there is an active program, the decoder will activate, displaying this program 916. If there is no program active, it



displays a message on the state of operation 903, informing that it is in the operation mode 'list', providing information about the next available program and informing that the receiver will turn off in a specified time. This time is counted down by a timer, displayed on the screen, where countdown starts from a specific time – for example 30 sec. (screen 1 from fig. 12). When the time counted down by the timer elapses 904, the decoder shifts to sleep mode 905 and waits in this state for an event 906. If the event is an activation of the decoder by the user, the procedure checks if in the given time there is any program available on the list 908. If there is no program available, it returns to step 903. If there is a program available, the program selected by the user will be started 916. The upcoming time of broadcasting a program from the list can be another event. When the decoder detects that a program will start in a certain time (for example 5 minutes), it will play a voice message 910, such as for example: 'in 5 minutes a program will be broadcasted' and display a message on the state of operation 911 on the screen, informing that in a given time the receiver will switch to reception of a specific program, while this time is counted down by a timer, visible on the screen. The message informs also about the possibility of reading information, available in EPG system, on the subject of this program. It will also make it possible to resign from watching this program (screen 2 from fig. 12). If the user decides to watch information related to the given program, the procedure will activate the program guide, indicating the requested program, which will allow the user to learn the content of the program and other information about it 913. If the user decides that he/she does not want to watch this program 914, the procedure will come back to step 905, which means that it will change over to the sleep mode. The effect will be that

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the decoder will no longer activate the receiver automatically in the moment, when the program will start, although the user will be able to switch on the receiver. If the user does not decide to stop the program, and the time counted by the timer 915 elapses, the decoder will start broadcasting the selected program 916. After setting the selected program in step



916, the receiver moves to point A, starting the procedure from fig. 11 of the drawing. The procedure waits for an event 930. If the event is the upcoming time of starting a broadcast of another program from the list (for example in 5 minutes), the sound message will be played. In this case, it can be a short sound, e.g. a gong 941 so that watching the current program is undisturbed. Next a stopper, showing the time, which has remained until the beginning of a new program is displayed with short information about it – possibly in a small form, so that watching the current program is undisturbed. The user, by means of a specific button of remote control unit can request the decoder to change to a new program, immediately when it starts (screen 3 from fig. 12). If the event is a selection of a program by the user, the procedure checks in the list if there is a program available to be watched 951. If there is one, the procedure switches the decoder into the selected channel 946. If there is no, it checks if the program is available on the list in a later time – 952. If so, it provides information, at what time the given channel will be available 953 (screen 4 from fig. 12). If not, it provides information that the given channel is unavailable 954 (screen 5 from fig. 12). Next in step 955 it waits a short while, for example 10 seconds, and it switches off the displayed information 956 and shifts to waiting for the next event. If the event is the end of broadcasting a program from the list, the system checks if there are other programs available on the list, broadcasted in this moment 961. If so, it moves to the first available channel on the list 962. Next it displays information on the end of broadcasting

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the previous program 963 (screen 6 from fig. 12), waits for a short time (10 seconds for example) 964, closes the displayed information 965 and moves to waiting for the next event. If there are no more programs on the list, the system gives information about the end of broadcasting the previous program 966 (screen 7 from fig. 12), in step 967 waits for a short time, for example 10 seconds, closes the displayed information 968 and moves to point B from fig. 10 of the drawing.



Examples of appearance of the screen at a specific hour and a specific event were shown in fig. 12. They refer to the list, presented in fig. 6.

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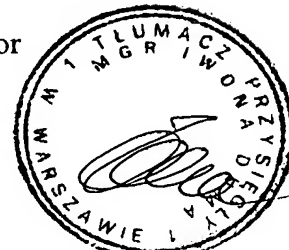
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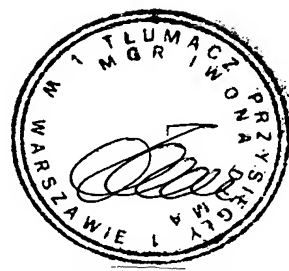
Patent claims

1. The method of controlling the operation of a digital TV decoder, equipped with an electronic program guide, by means of which the user selects programs, out of which a list controlling the operation of the decoder is composed, **characterized in that** in the time of the beginning of the program from the control list, created by the user earlier by selection of programs, the decoder shifts from the sleep mode into an active mode, in which the user can watch only the programs, located on the list. After the end of the programs from the list, in case when no other programs, recorded on the list, are available, the decoder shifts into sleep mode. Meanwhile, each time a new program from the list starts, the decoder generates information signal.
2. The method, according to claim 1 **characterized in that** there are many lists available, which control the operation of the decoder. The lists are created by the user or



conferred by the operator, and the user makes a choice as to which list should control the operation of the decoder.

3. The method, according to claim 1, **characterized in that** the lists controlling the operation of the decoder are associated with a specific subject group.
4. The method, according to claim 1, **characterized in that** the lists which are conferred by the operator can be subject lists or they can be lists associated with the names of known people, creating thereby so called preferential lists.



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5. The method, according to claim 1, **characterized in that** every time a new program from the list starts, the decoder plays a sound information in form of a specific sound or a verbal announcement.

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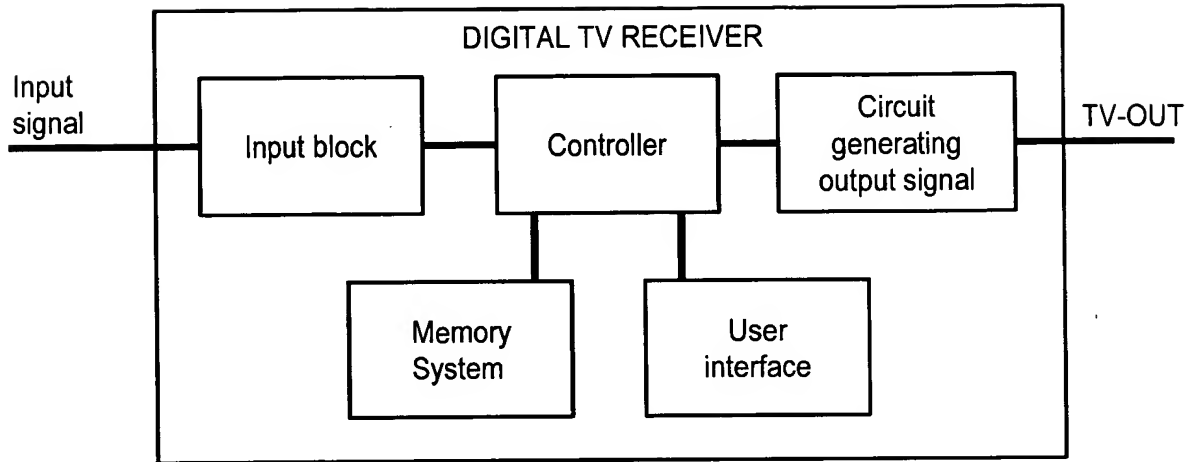
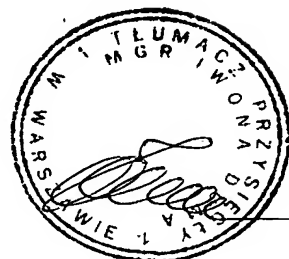


Fig. 1

Program	12.00	12.30	13.00	13.30	14.00
TV1	News		Soccer match Poland – Germany		
TV2	Film "Indiana Jones"				
TV3	News		Soccer match Poland – Germany		
MTV	The 80'		The 90'		
FILM	Film "Jaws"				
Cartoon	Pluto the Dog		Manga		
TV8	Quiz show			News	

You are in the channels list setting mode
Press OK to add a channel to the list
Press EXIT to leave list setting mode

Fig. 2



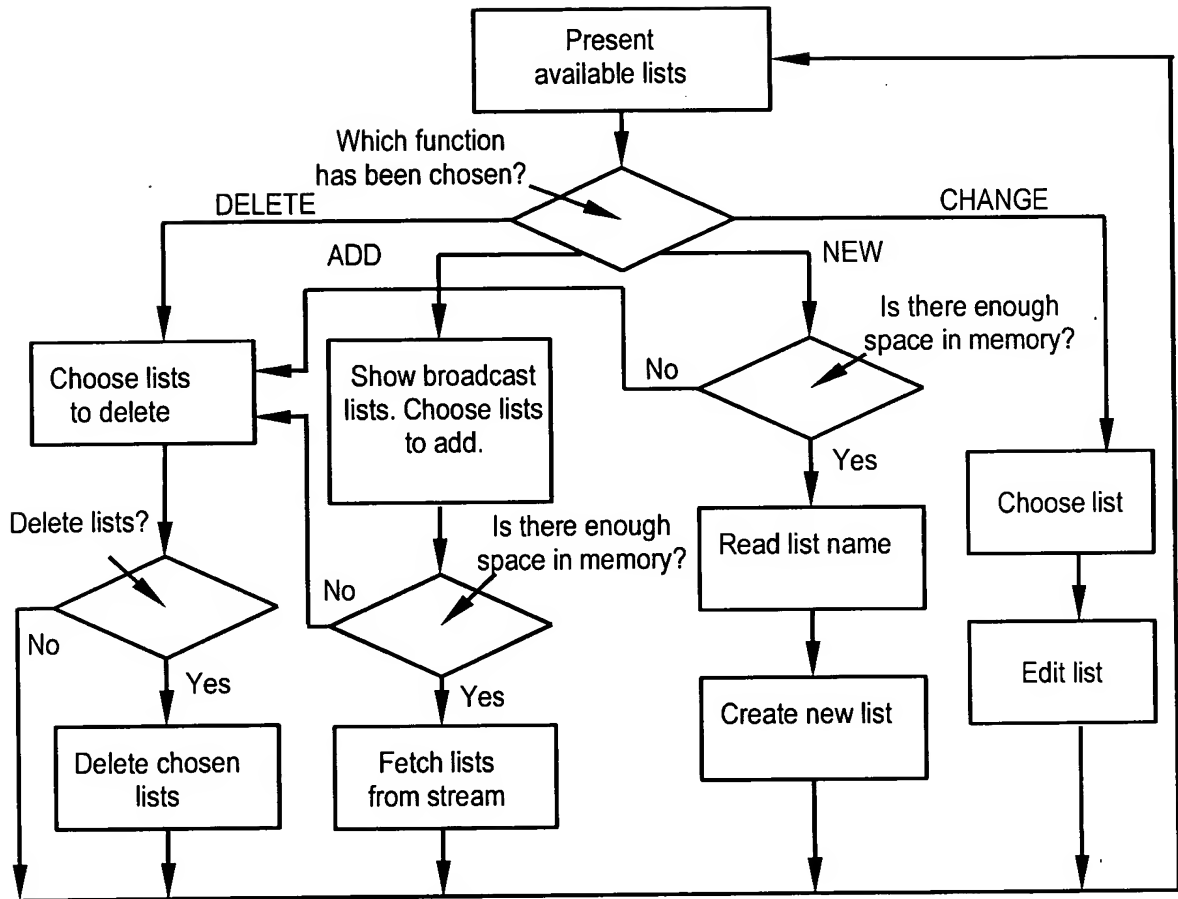


Fig. 3

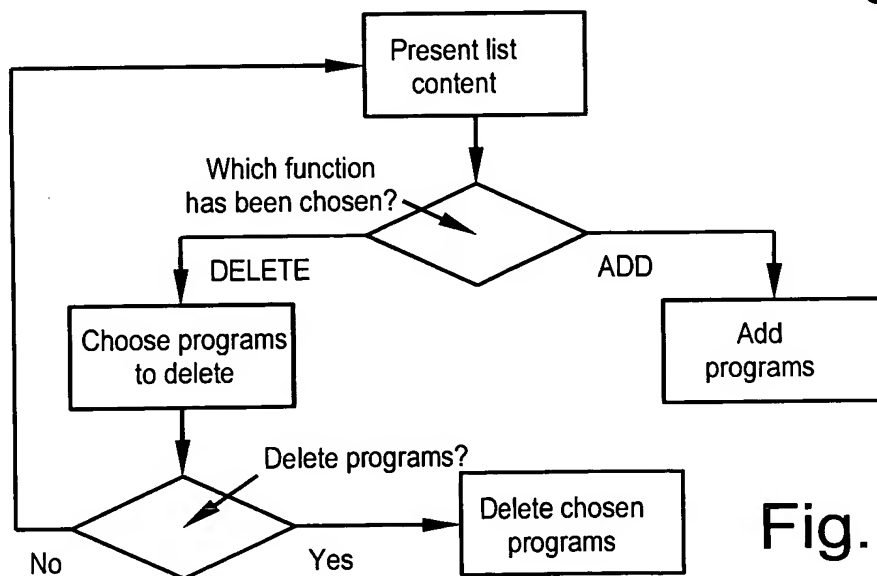
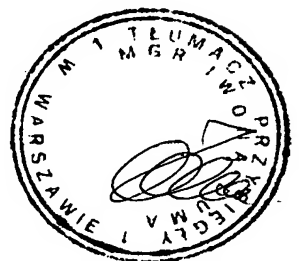


Fig. 4



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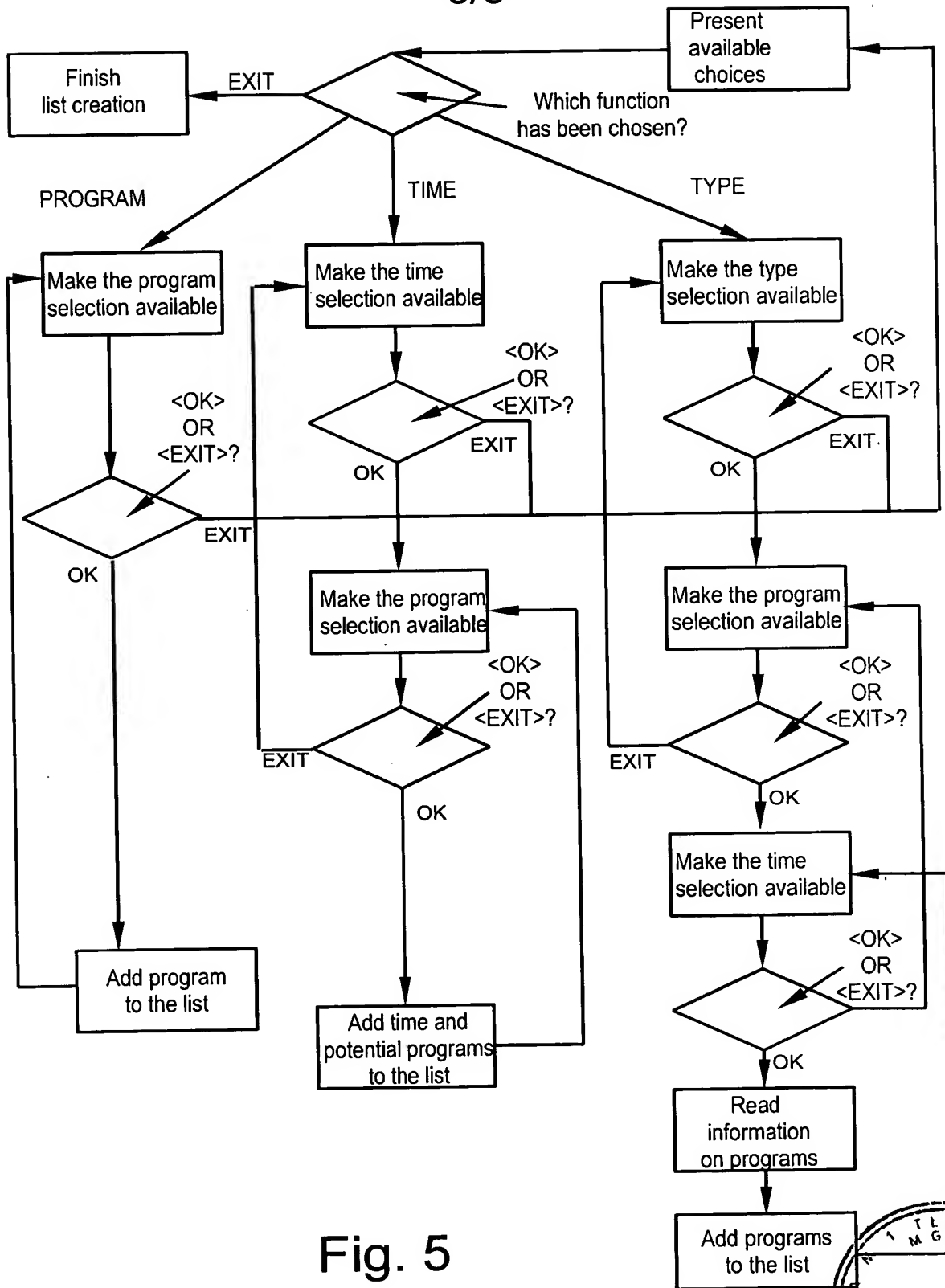
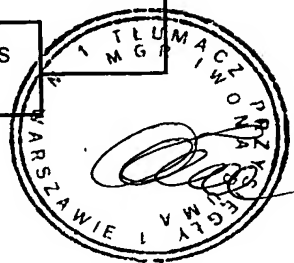


Fig. 5



Time	Channel name	Program name
12.00-12.30		
18.20-18.40	Cartoon	Pluto the Dog
19.20-19.40	News 1	News
19.30-19.50	News 2	News
20.20-20.40	News 1	
20.20-20.40	News 2	

Fig. 6

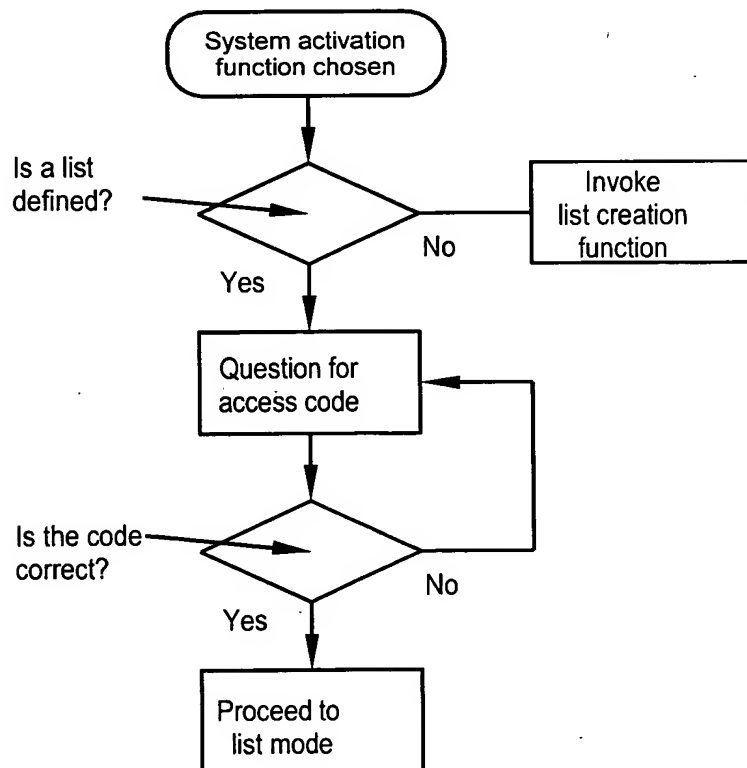
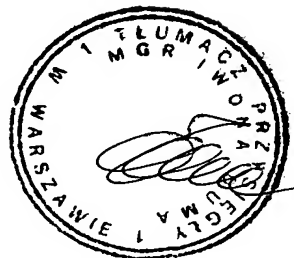


Fig. 7



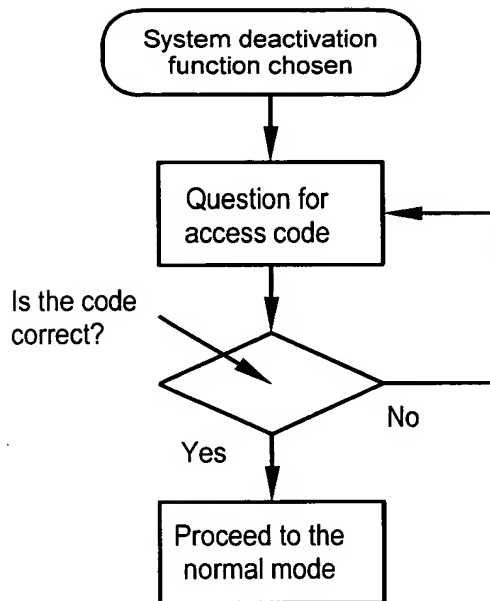


Fig. 8

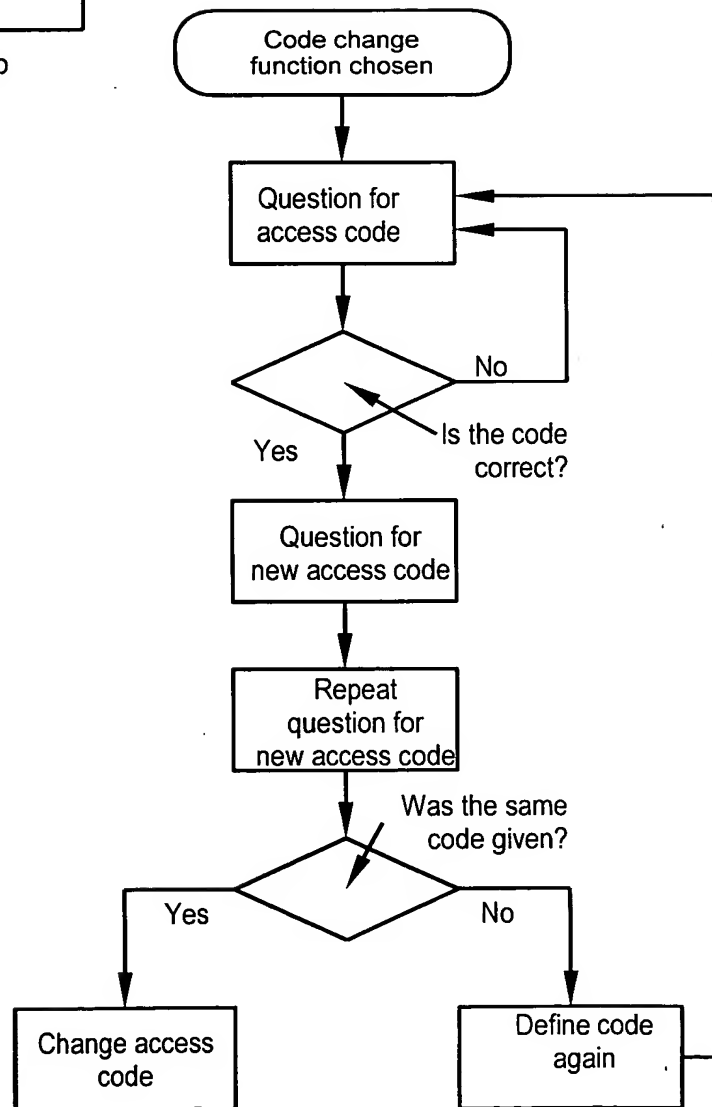
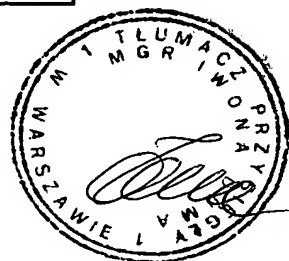


Fig. 9



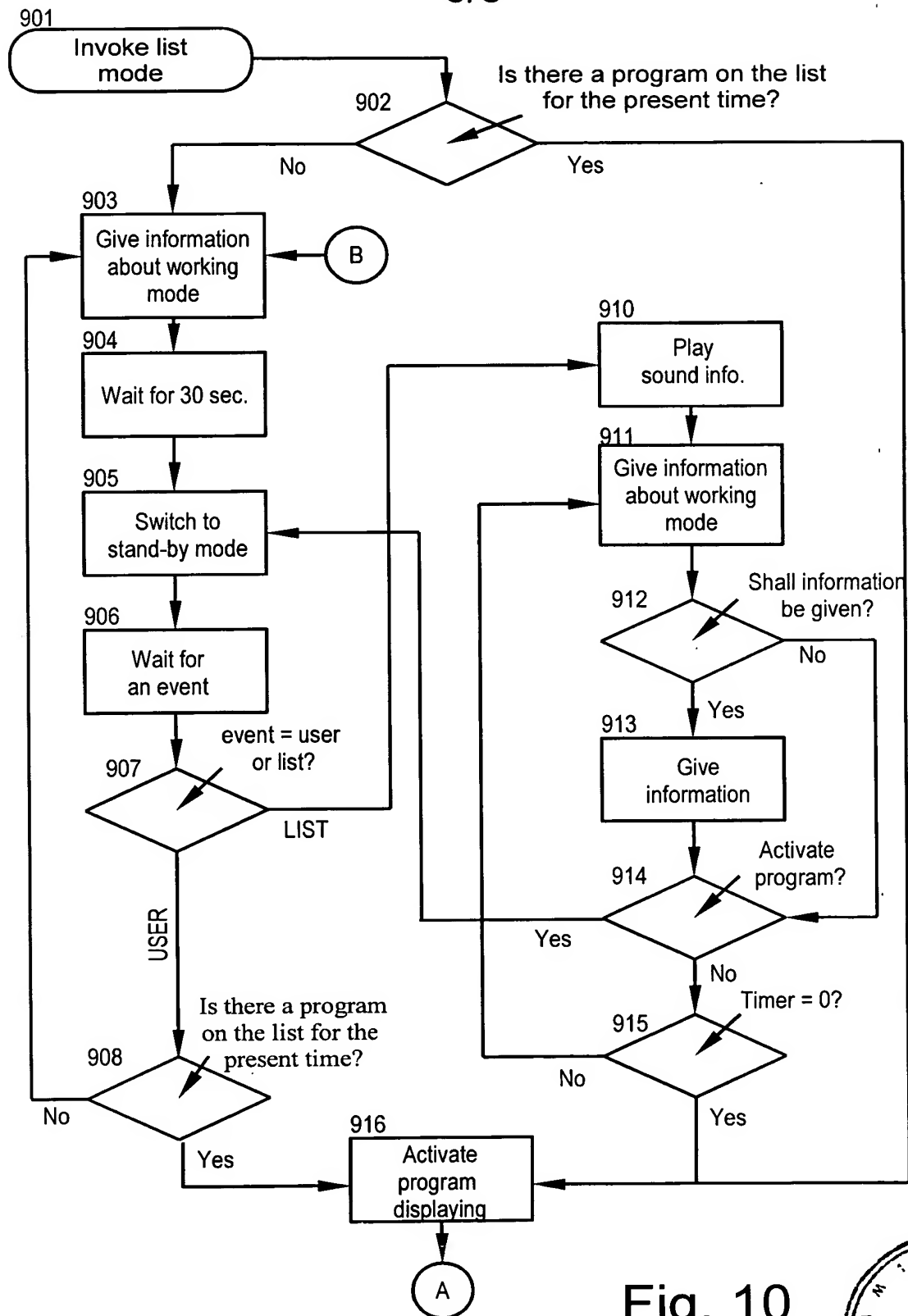
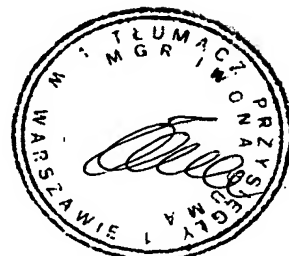


Fig. 10



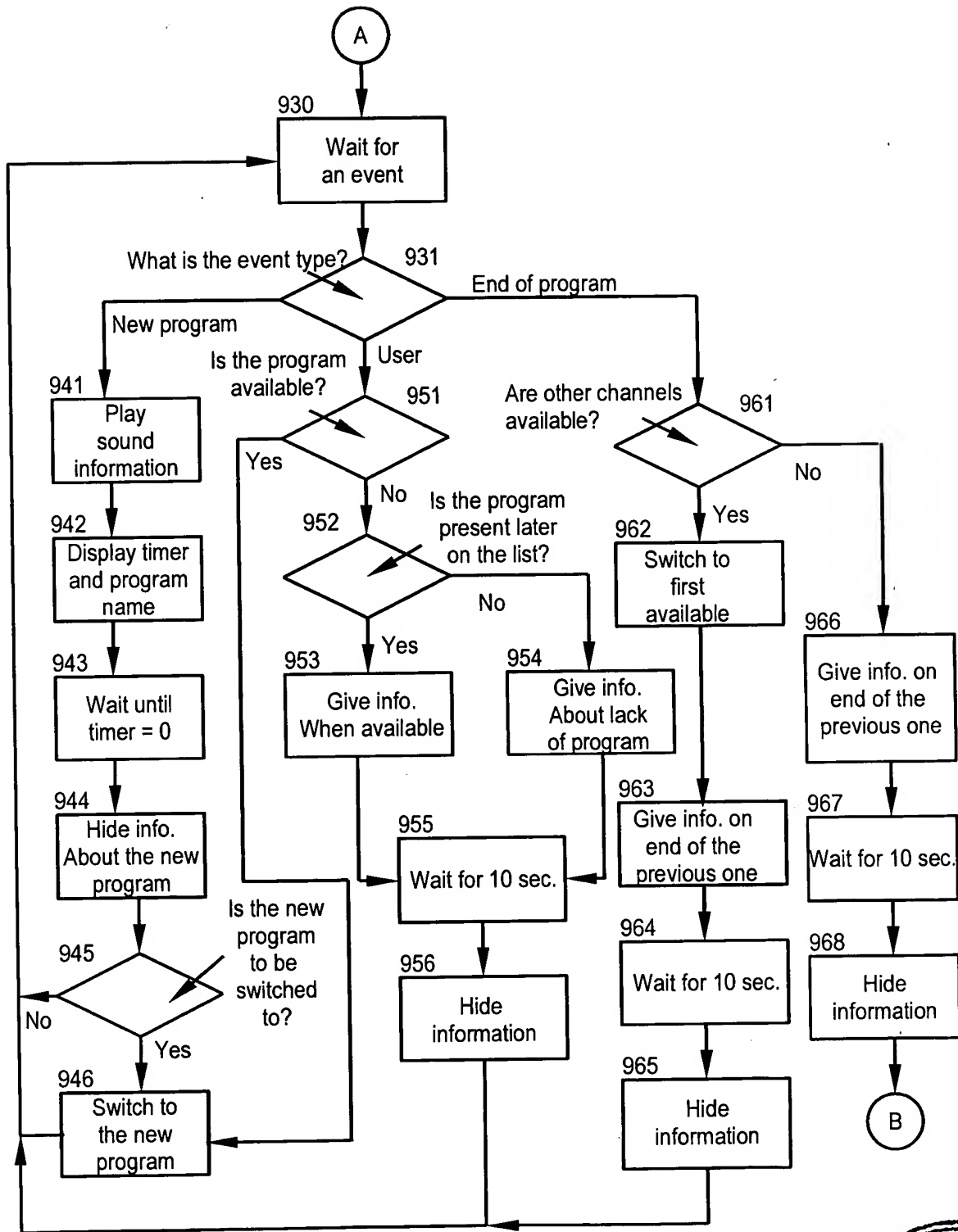


Fig. 11



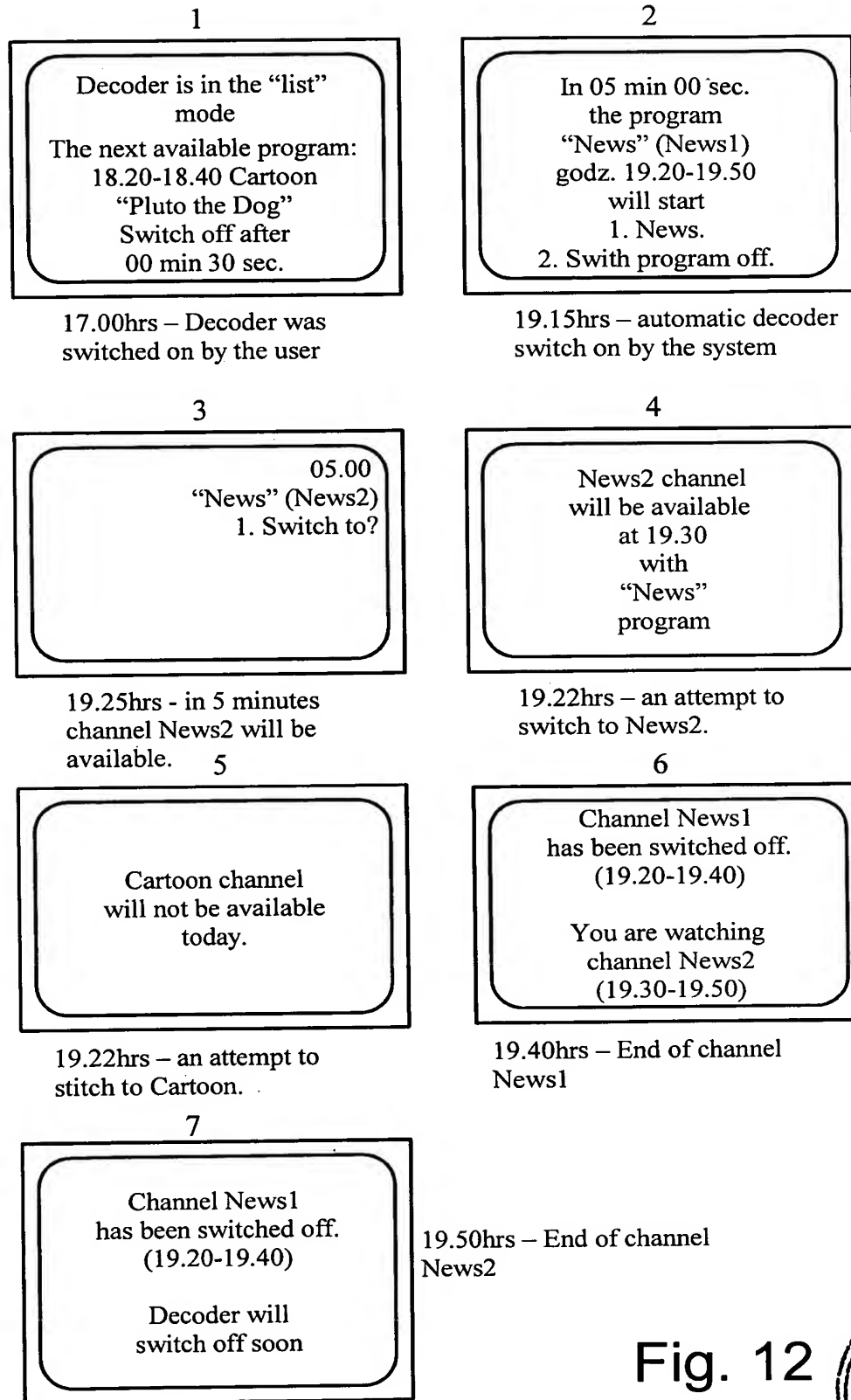


Fig. 12



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I, the undersigned, Iwona Duma, sworn translator of the English language for the District Court of the City of Warsaw, hereby certify that the above text is a true and complete translation of the Polish document.

Warsaw, December 18, 2003.

